83781

s/056/60/039/003/045/045 B004/B060

9,4300 (1035,1138,1143) AUTHOR:

Khaykin, M. S.

TITLE:

Paramagnetic Resonance on a Single Crystal of Tin

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,

Vol. 39, No. 3 (9), pp. 899-901

TEXT: The author studied the electron paramagnetic resonance on a single crystal of pure tin (impurity content (6.10-5%). The single crystal constituted the inner conductor of a resonator adjusted to 9.35.109 cps. Measurements were made at 2.30K and with frequency modulation. Figs. 1,2 show the paramagnetic resonance lines of Sn in addition to those of diphenyl-picryl hydrazyl taken as a standard. Therefrom the author calculated the g-factor for the conduction electrons of tin, $g_{\rm Sn}=1.9945\pm0.0003$, and the relaxation time, $T_2=1.7\cdot10^{-8}$ sec. This

corresponds to a 1 - 2 cm electron path length, without there appearing any spin flip; (mean free path: 0.1 cm). The diffusion length δ of the spin is taken as about 0.3 cm from Refs. 3, 10. Thus, nuclei throughout

Card 1/2

18.8100 1138 1144 1482

27706 \$/120/61/000/003/018/041 E202/E135

AUTHOR:

Khaykin, M.S.

TITLE:

Study of the surface resistance of metals by means of frequency modulation

PERIODICAL: Pribory i tekhnika eksperimenta, 1961, No.3, pp.95-103

TEXT: A new method of measuring surface resistance of a single crystal of metal in the superconducting region is described. This method is capable of high accuracy quantitative measurement of weak anisotropic effects by measuring the change in the surface conductivity amounting to only a fraction of a per cent of the total value. Thus, in the first instance, the method is directed to the study of anomalous skin effects, cyclotron resonance-like effects and general measurements of surface resistance of metals, where it has considerable advantages over the orthodox methods based on the calorimetric estimation of the Joule heat dissipated by the H.F. currents, or the evaluation of the electric parameters of the resonator convenience the sample. Further applications include measurements of changes in the dielectric permittivity or magnetic permeability arising from electron paramagnetic resonance, Card 1/3

Study of the surface resistance of ...

- 27706 S/120/61/000/003/018/041 E202/E135

diamagnetic resonance in semiconductors, ferromagnetic resonance, etc. In the present method, the sample in the shape of a rectangular plate or a disc forming the integral part of the H.F. electromagnetic resonator, is placed in a steady and uniform magnetic field. The change in the field affects the surface resistance of the sample which in turn changes the parameters of the resonator. The latter forms part of a reaction coupling of an H.F. oscillator and influences the frequency of the generated signal. Hence, the modulation of the magnetic field leads to the frequency modulation in the generated signal. The surface resistance of the sample is found in terms of its first derivative w.r.t. magnetic field, by measuring the frequency deviation. The experimental results show that surface reactance and surface resistance values are measured with the sensitivity of approximately 10-6 oe-1, estimated as equal to the noise level. The H.F. employed was of the order of 9400 Mcs. Detailed theoretical and experimental data are included. Acknowledgments are expressed to P.L. Kapitsa, A.I. Shal'nikov for their interest in the work, and to G.S. Chernyshev and A.N. Vetchinkin, K.A. Zhdanov and V.A. Yudin Card 2/3

Study of the surface resistance of ... \$/120/61/000/003/018/041 E202/E135 for technical assistance. There are 7 figures and 20 references: 10 Soviet and 10 non-Soviet. The four most recent English language references read as follows: Ref. 3: M.A. Biondi, M.P. Garfunkel, A.O. McCoubrey, Phys. Rev., 1956, Vol. 101, 1427; M.A. Biondi, M.P. Garfunkel, Phys. Rev., 1959, Vol.116, 862. Ref. 4: E. Fawcett, Proc. Roy. Soc. A, 1955, Vol. 232, 519; E. Fawcett, Phys. Rev. Let., 1959, Vol.3, 139. Ref. 8; J. K. Galt, W.A. Yager, F.R. Merritt, B.B. Cetlin, H.W. Dail, Phys. Rev., 1955, Vol. 100, 748; J.K. Galt, W.A. Yager, F.R. Merritt, B.B. Cetlin, Phys. Rev., 1959, Vol. 114, 1396. Ref. 13: A.F. Kip, D.N. Langenberg, B. Rosenblum, G. Wagoner, Phys. Rev., 1957, Vol. 108, 494. ASSOCIATION: Institut fizicheskikh problem AN SSSR (Institute of the Problems of Physics, AS USSR) SUBMITTED: June 21, 1960 Card 3/3

9,4230(1532)

27707 \$/120/61/000/003/019/041 E095/E135

AUTHOR:

Khaykin, M.S.

TITLE:

Travelling-wave tube oscillator stabilised by a superconductive cavity resonator

PERIODICAL: Pribory i tekhnika eksperimenta, 1961, No.3, pp.104-106

TEXT: In a conventional oscillator design, frequency stability is determined by resonator Q, which at high frequencies is limited by skin-effect. Resonator Q can be increased 1000 times by utilizing the superconductivity phenomenon which, according to earlier work of the author, occurs for lead at 7 °K. The blockschematic of the oscillator employing travelling wave tube and lead is shown. The cavity Q is about 3 x 107. Frequency stability is given by

 $\frac{\mathbf{t}}{\mathbf{qt}} \approx \frac{\mathbf{d}}{\mathbf{r}} \frac{\mathbf{y}}{\mathbf{qt}}$

where ℓ is length of signal path in the generator, assuming that resonator characteristics are stabilised and it is lightly coupled Card 1/2

Travelling-wave tube oscillator

27707 S/120/61/000/003/019/041 E095/E135

to the external circuit. Two oscillators were constructed on these principles. Measured frequency stability is 10-9 approximately, over a period of one hour. Frequency stability over shorter periods was not measured but it should be considerably higher. This is particularly true for periods of less than the decay period of the resonator which is about 1 ms. Power output is 1 mW. oscillator constructed on the above principles has been utilised for a long time for very accurate measurements in the course of research work (Ref. 2: M.S. Khaykin, PTE, 1961, No. 3, 95, and Ref. 7: M.S. Khaykin, Zh. eksperim. i teor. fiz., 1959, Vol. 37, 1473; 1960, Vol.39, 212, 513, 899). Acknowledgments are expressed to P. L. Kapitsa, A. I. Shal'nikov, Ye. G. Solov'yev and G.S. Chernyshev. There are 1 figure and 7 references: 6 Soviet and the following English language reference:

Ref. 4: H.R. Johnson, J.R. Whinnery, Trans. I.R.E., PGED-2, 1953, Jan., pp.11-35.

ASSOCIATION: Institut fizicheskikh problem AN SSSR (Institute for Problems of Physics, AS USSR)

Card 2/2

SUBMITTED: June 21, 1960

9.2580

S/019/61/000/013/014/075 A154/A128

AUTHOR:

Khaykin, M.S.

TITLE:

A method of stabilizing frequency

PERIODICAL:

Byulleten' izobreteniy, no. 13, 1961, 26

TEXT: Class 21a4, 802. No. 139343 (704851/26 of January 7, 1960). This invention consists in the use of a superconductive metal cavity resonator for stabilizing frequency.

Card 1/1

31773 5/056/61/041/006/016/054 B102/B138

24,7700 (1164, 1164, 1385)

Khaykin, M. S.

TITLE:

Direct measurement of conduction electron momentum of a metal

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41,

no. 6(12), 1961, 1773-1779

TEXT: A new method for direct measurement of the electron momentum of a metal and investigation of its Fermi surface is described. It is based on "cutting off" the electron orbits at cyclotron resonance. E. A. Kaner (DAN SSSR, 119, 471, 1958) and M. Ya. Azbel' (ZhETF, 39, 400, 1960) noted the theoretical possibility of measurement. The momentum of an electron moving on the greatest closed orbit within a metal plate of the thickness $\mathbf{P}_{\mathbf{z}}$, which is placed in a constant magnetic field $\mathbf{H}_{\mathbf{v}}$, is given by = $H_y D_z e/2c$. If H_y is chosen such that the electron orbit equals D_z , p will give the maximum value of the momentum component. H is determined from measurements of the highest orders n and n+1 of resonance in plates Card 1/4

31773 \$/056/61/041/006/016/054 B102/B138

Direct measurement of conduction ...

differing in thickness by one order of resonance: $H_n > H_y > H_{n+1}$. The accuracy is increased with n, i. e. with the plate thickness. In the case of cyclotron resonance $p_x = m^* \omega D_z / 2n$, m^* being the effective electron mass. We the h-f field frequency. The only disadvantage of the method is the necessity of observing high-order resonances and very high quality single crystals are required. The method was checked with high purity tin single crystal discs, cut parallel to the (010) plane. These were placed in the cavity resonator so that the h-f current hit the disc in the [100] direction. The magnetic field was applied in the [001] direction. Resonance n=26 was exceedingly clear; m=27 was not observed. With the formulas given, the electron momentum at the section of the Fermi surface with the (001) plane was determined: $p_{[100]} = (5.57 \pm 0.15) \cdot 10^{-20} \text{g} \cdot \text{cm/sec}$. The mean velocity of these electrons was found to be

V(001) = $\omega D_z / 2n = (1.10 \pm 0.01) \cdot 10^8 \text{cm/sec}$. A is neasured with an accuracy of ± 15 , and the momentum with $\pm 2.5\%$. For the electrons of this group Card 2/4

31773 S/056/61/041/006/016/054 B102/B138

Direct measurement of conduction ...

(within the range of $\pm 26^{\circ}$ of field direction) p = $(9.98\pm0.15)\cdot 10^{-20}$ m*/me (m* = 0.558 me). From the results the Fermi surface section shown in Fig. 4 was constructed which corresponds to the open quarter of the Brillouin zone shown in Fig. 5. The results are compared with those of N. Ye. Alekseyevskiy, Yu. P. Gaydukhov et al. (ZhETF, 39, 1201, 1960; 41, 1079, 1961), A. I. Galkin, E. A. Kaner and A. P. Korolyuk (ZhETF, 39, 1517, 1960). P. L. Kapitsa is thanked for interest, R. T. Min, G. S. Chernyshev and V. A. Yudin for assistance. There are 5 figures and 15 references: 12 Soviet and 3 non-Soviet. The three references to Englishlanguage publications read as follows: A. V. Gold, M. G. Priestley. Phil. Mag., 5, 1089, 1960; W. A. Harrison. Phys. Rev. 118, 1190, 1960; T. Olsen. The Fermi Surface, ed. W. A. Harrison a. M. B. Webb (Proc. of Int. Conf., 1960), N. Y., 1960, p. 237.

ASSOCIATION: Institut fizioheskikh problem Akademii nauk SSSR (Institute of Physical Problems of the Academy of Sciences, USSR)

SUBMITTED:

July 11, 1961

Card 3/4

5/056/62/042/001/004/048 B125/B108

AUTHOR:

Khaykin, M. S.

TITLES

Study of the Fermi surface of tin by the cyclotron resonance

method

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42,

no. 1, 1962, 27 - 34

TEXT: Cyclotron resonance spectra are studied by means of a band resonator. Monocrystalline disks (18 mm diameter, 1-2 mm thick) made of high-purity

tin with a resistivity ratio $\varrho(20^{\circ}\text{C})/\varrho(3.75^{\circ}\text{K}) = 1.4^{\circ}10^{5}$ served as specimens. Fig. 4 shows the effective masses of the conductivity electrons of tin determined from the cyclotron resonance spectra, including the holec which do not differ from the electrons in the present experiments. Some characteristic properties of cyclotron resonances are given in the table.

Resonances at HIJ and HIIJ, respectively, which correspond to extreme cross sections of the Fermi surface or to the elliptic base points, as well as resonances observed at intermediate polarizations, belong to the noncentral

Card 1/1/3

Study of the Fermi surface of

S/056/62/042/001/004/048 B125/B108

Fermi surfaces. Some typical characteristics of the very complicated Fermi surface had been studied by N. Ye. Alekseyevskiy, Yu. P. Gaydukov (ZhETF, 40. 1079, 1961). Fig. 5 shows the hole surfaces of the third and fourth bands of tin which correspond best to available data. Tube & has the diameter $\Delta = 0.17(2\pi/a) = d$, and the cross-sectional area of tube δ , which is considered to have the form of a circular cylinder, amounts to $0.023(2\pi/a)^2$. The area of the orbit, ϵ , is $(h+2\Delta)d = 0.14(2\pi/a)^2$. The dimensions of the third band suggest cyclotron resonances over the tubes \$ allowing for deflections of the field from the [001] and [100] axes in the (010) plane through \sim 20° and \sim 35°, respectively. No other method is so sensitive and accurate as the measurement of the effective electron masses by the cyclotron resonance method. P. L. Kapitsa is thanked for interest, V. A. Yudin for technical assistance. There are 5 figures, 1 table, and 45 references; 3 Soviet and 7 non-Soviet. The four most recent references to Englishlanguage publications read as follows: F. R. Merritt, P. H. Schmidt Phys Rev. Lett., 6, 458, 1961: J. E. Aubrey, R. G. Chambers. Phys. Chem. of Solids, 3, 128, 1957; J. E. Aubrey. Phil. Mag., 5, 1001, 1960; A. V. Gold, M. G. Priestley. Phil. Mag., 5, 1089, 1960; W. A. Harrison. Phys. Rev., 118, 1190, 1960. Card 2/73

according to Gold and Priestley; ϕ - angle between H and the direction [001]; Card 3/72

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mic practice and

S/056/62/042/001/005/048 B125/B108

AUTHORS:

Knaykin, M. S., Mina, R. T.

TITLE:

Investigation of the Fermi surface of lead by the cyclotron

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42,

no. 1, 1962, 35 - 41

TEXT: Cyclotron resonance in the (100) and (011) planes of rectangular single-crystal plates of lead with a resistivity ratio $\varrho(20^{\circ}\text{C})/\varrho(4.2^{\circ}\text{K})$ = (0.6 - 1)·10⁴ was measured by frequency modulation at 9.47·10⁹ cps in a magnetic field of 800 - 7000 cersteds at 2 K. Two specimens with the high-frequency current and magnetic field directions are shown in Fig. 1. The ratio $\mu=m^*/m_e=H_\omega^{-1}/(H_{n+1}^{-1}-H_n^{-1})$ (1) (m = effective electron mass, m_e . free electron mass, H_{ω}^{c} = field strength at electron paramagnetic resonance, H_{n} = field strength at cyclotron resonance of the order n_{σ} . The depth of cyclotron resonance of any group belonging to a certain effective

CIA-RDP86-00513R000721920007-3" **APPROVED FOR RELEASE: 09/17/2001**

Investigation of the Fermi surface...

S/056/62/042/001/005/048 B125/B108

mass depends on the direction of the magnetic field. However, group (has the deepest resonance of all. The lower and upper parts of the polar diagram (Fig. 3) show $\mu(9)$ data for specimens 1 and 2, respectively. The Fermi surface model presupposes free electrons in the weak field of the crystal, the first Brillouin band filled up, a second band with closed central hole surface, and a third band filled up near the edges. Cyclothum resonances are observed on the outermost closed orbits with an orbital plane perpendicular to the magnetic field. The electron surface of the third band is shown in Fig. 4. The proportionality between the effective electron mass and the tube cross section is the better for a real Fermi surface, the less this surface deviates from cylindrical form. The deep cycletron resonances on the f_1 , f_2 , f_3 , f_4 orbits are due to the nearly cylindrical form of the tubes. With a magnetic field parallel to the [111] axis, cyclotron resonance arises on orbit v. $\int v_{+}^{-1} dl = 2\pi m^{\frac{2\pi}{3}}$ to I. M. Lifshits, M. Ya. Azbel', and M. I. Kaganov (EhETF, 31, 63, 1956). Cyclotron resonances were observed on all extreme orbits lying in the multiply connected Fermi surface of the third band. Data are in good qualitative and quantitative agreement with the form of the third band

Investigation of the Fermi surface...

s/056/62/042/001/005/048 B125/B108

Fermi surface as constructed in free electron approximation. P. L. Kapitaa is thanked for interest, G. S. Chernyshev and V. A. Yudin for technical assistance. There are 5 figures, 2 tables, and 8 references; 5 Soviet and 3 non-Soviet. The three references to English-language publications read as follows: J. E. Aubrey. Phil. Mag., 2. 1001, 1960; Ref. 4: A. V. Gold. Phil. Trans. Roy. Soc., 251, 85, 1958; W. A. Harrison. Phys. Rev., 118, 1190, 1960.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute

of Physical Problems of the Academy of Sciences USSR) Fizicheskiy institut Akademii nauk Arnyanskoy SSR (Physics

Institute of the Academy of Sciences Armyanskaya SSR)

SUBMITTED: July 11, 1961 (initially), and November 2, 1961 (after

revision)

Legend to Fig. 1: (1) specimen 1, (2) specimen 2.

Card 3/63

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000721920007-3

\$/056/62/043/001/008/056 B125/B102

AUTHOR:

Khaykin, M. S.

TITLE:

Investigation of the shape of one cross section of the

Fermi surface of tin

PERIODICAL:

Zhurnal eksperimental noy i teoreticheskoy fiziki, v. 43,

no. 1(7), 1962, 59-65

TEXT: The cross-section diameters of the "barrel-shaped" hole Fermi surface of the fourth band in tin were measured by the method of frequency modulation on a wavelength of ~ 3.2 cm. Two effects were considered in the measurements: (1) cutoff of cyclotron resonances and (2) cutoff of electron orbits in a non-resonance field. The cutoff field strength increases with increasing angle up to $\varphi = 33^{\circ}$. The derivative of the resistance (resistance + reactance) with respect to the field strength which is determinant for the diameter of the extreme electron orbits has a greater absolute value for thin than for thick specimens. This holds true until the diameter of the extreme electron orbits is equal to the thickness of the specimen. The non-resonance orbits found with the Card 1/6

Investigation of the shape of ...

S/056/62/043/001/008/056 B125/3102

aid of the cutoff field strength cover the entire section. Investigations into cyclotron resonance confirmed the existence of two types of extreme electron orbits: The maximum electron orbit & lies in the section of the coordinate face (CO1), the minimum electron orbit & lies in the section of the "barrel" face (2 orbits) parallel to (CO1). The suitability of the model of almost free conduction electrons is confirmed by a good agreement of the observed shape of the section of the fourth band face with the results obtained with this model. There are 5 figures.

ASSOCIATION:

Institut fizicheskikh problem Akademii nauk SSSR (lestitute

of Physical Problems of the Academy of Sciences USSR)

SUBMITTED:

March 6, 1962 :

Fig. 5. Hole Fermi face for the fourth band of tin reduced to the principal Brillouin band. The cross section studied here is marked by a bold line. Extreme orbits when the magnetic field is parallel to [001]: \$\frac{1}{2} - \text{maximum}\$, \$\text{\$\sigma}\$ - \text{minimum}\$ orbit (two orbits, their approximate position is given).

Cari 2/8 2

44228 3/056/62/043/006/017/067 B102/B104

24.7000 AUTHORS:

Khaykin, M. S., Mina, R. T., Edel'man, V. S.

TITLE:

Cyclotron resonance and quantum oscillations of the surface

impedance of bismuth

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43,

no. 6(12), 1962, 2063-2073

TEXT: Disc-shaped Bi single crystals of 18 mm diameter and 1.5 mm thick were used to measure simultaneously the cyclotron resonance and the quantum oscillations of the surface impedance at 9.5.10 cps and at 1.70 K. The measurements were made by the method of frequency modulation (PTE, 3, 95, 1961); the logarithmic derivative of the surface reactance was measured as a function of the inverse measured as a function of the inverse measured as a function of the inverse the sample parallel to its surface. Of two of the samples this surface agreed with the basal plane ($1 C_3$) and for the two others the axes C_3 and C2 lay in the surface plane. The cyclotron resonance was measured in order to determine the effective masses $\mu=m^4/m_0=e/m_e c \omega \Delta_1 H^{-1}$ Card 1/3

Cyclotron resonance and quantum oscillations... B102/B104

carriers and to explain the characteristics of the effective mass anicotropy; $\Delta_1 H^{-1}$ is the period of cyclotron resonances measured in the plane of the sample with rotating field. The characteristics of the electron and hole Fermi surfaces. The main result of the investigations was the determination of the extremal cross section areas S of the Fermi surface perpendicular to H. They were calculated from the quantum oscillation periods ΔH^{-1} : $S = eh/c\Delta H^{-1}$. At angles equal to or less than 30° between H and C_2 the effective electron mass was proportional to S. The end-point energy of the Bi electrons was calculated: $E_0 = S/2\pi\mu m_0 = (2.5\pm0.1)\cdot10^{-14} erg$, a value, that corresponds to an effective temperature of $181\pm7^{\circ}K$; the corresponding electron velocity is $V_0 = \sqrt{2E_0/\mu m_0} = (7.7\pm0.2)\cdot10^{7} cm/sec$. Some more details on the Fermi surface are discussed. There are 6 figures.

\$/056/62/043/006/017/067 Cyclotron resonance and quantum oscillations...B102/B104

ASSOCIATION: Institut fizicheskikh problem Akademiya nauk SSSR

(Institute of Physical-Problems of the Academy of Sciences

USSR)

SUBMITTED:

July 20, 1962

Card 3/3

J. H. F. J. J. U40/104 AUG 2 AIUI

AUTHORS:

Khaykin, M. S., Derstuganov, G. I., Levkoyev, I. I., Kukhtin, V. A.,

Shamil'skaya, D. B.

TITLE:

On the developing properties of some 4-aminopyrazolones (5) and

their derivatives. Report II

in a commission Property

The the thereing.

PERIODICAL: Referativnyy zhurnal, Fizika, no. 3, 1963, 82, abstract 3D560

("Tr. Vses. n.-i. kinofotoin-ta", 1362, no. 40, 5 - 16)

TIDIT: A synthesis was made of some 1-phenyl and 1-sulphophenyl-3-carbmethoxy- and 3-carbalcoxymethyl-4-aminopyrazolones (5). The developing properties of these compounds were invertigated. It is shown that the conservation of weakly alkaline developing solutions, containing 4-aminopyrazolones, depends i to a large extent on the electron character of the substitutes in the 1st and 3rd positions of these compands. It is made clear that the introduction of electronegative substitutes into the 1st and 'rd position of 4-aminopyrazolones tartifier the gavelous

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A study was made on the influence of some derivatives of polyphenols

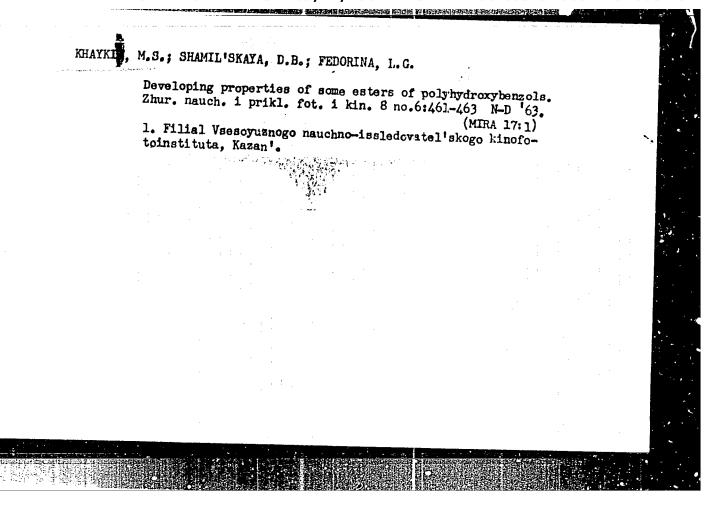
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KHAYKIN, M.S.; SHAMIL'SKAYA, D.B.; FEDORINA, L.G.

Developing properties of hydroxybensovipyrogallol. Zhur nauch. i prikl.fot. i kin. 8 no.5:375-376 S-0 *63. (MIRA 16:9)

1. Filial Vsesoyuznogo nauchno-issledovatel*skogo kinofotoinstituta (NIKFI), Kazan*.

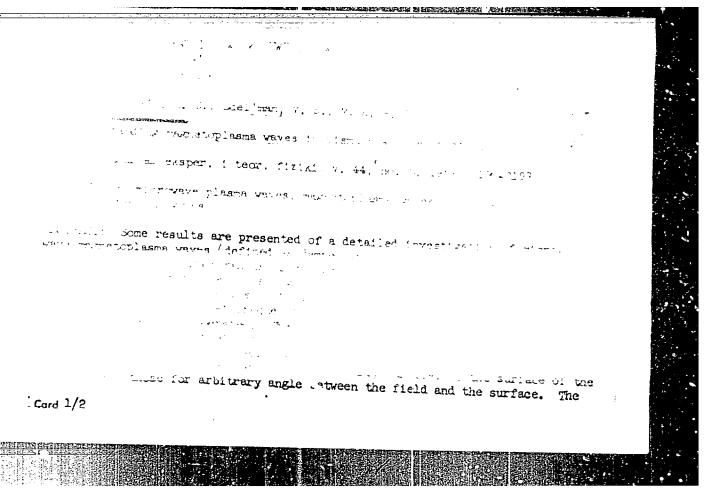


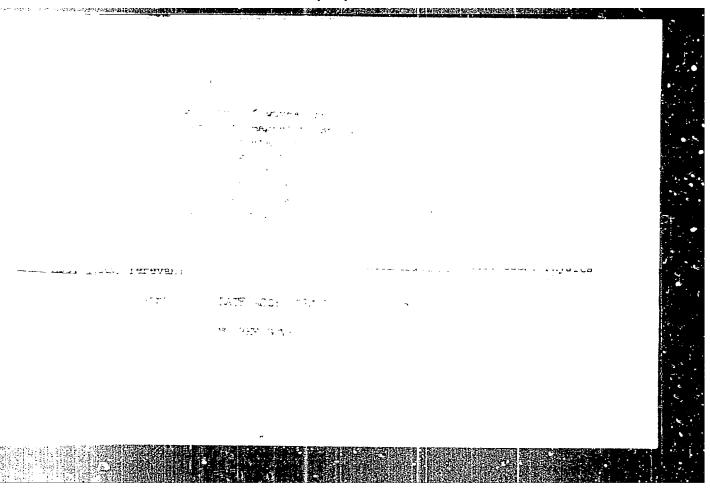
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KHAYKIN, M.S.; PETROVA, N.L.; KUKHTIN, V.A.

Chlorination of dihydroxycoumarins. Zhur.ob.khim. 33 no.12:3941-3943 D 63. (MIRA 17:3)

1. Kazanskiy filial Vsescyuznogo nauchno-issledovatel'skogo kino-fotoinstituta.





EDEL'MAN, V.S.; KHAYKIN, M.S.

Standing magnetic plasma waves in bismuth related to hybrid resonance. Zhur. eksp. i teor. fiz. 45 no.3:826-828 S *63. (MIRA 16:10)

1. Institut fizicheskikh problem AN SSSR.

(Magnetohydrodynamics) (Plasma (Ionized gases)

MINA, R.T.; KHAYKIN, M.S.

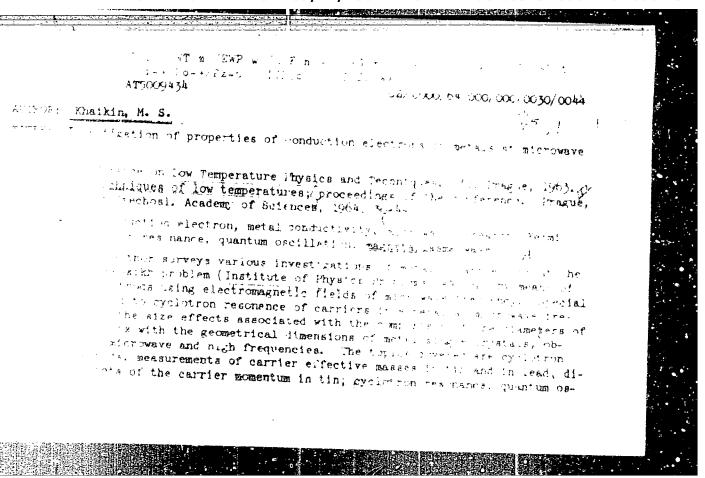
Use of the cyclotron resonance method in studying the Fermi surface of lead. Zhur. eksp. i teor. fiz. 45 no.5:1304-1316 (MIRA 17:1)

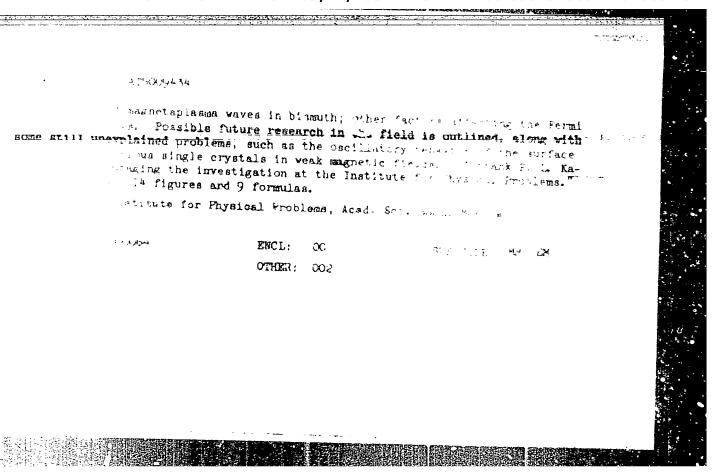
1. Institut fiziche kikh problem AN SSSR i Fizicheskiy institut Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.

KHAYKIN, M.S.; FAL'KOVSKIY, L.A.; EDEL'MAN, V.S.; MINA, R.T.

Properties of magnetic plasma waves in bismuth single crystals. Zhur. eksp. i teor. fiz. 45 no.6:1704-1716 D '63. (MIRA 17:2)

1. Institut fizicheskikh problem AN SSSR i Fizicheskiy institut Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy entergii SSSR, Yerevan.





KHAYKIN, M.S.; SHAMIL'SKAYA, D.B.; FEDORINA, L.G.

Developing properties of the alkyl derivatives of 7,8 dihydroxybenzopyrylium chloride. Zhur. nauch. i prikl. fot. i kin. 8 no.3:209-210 My-Je '64. (MIRA 18:11)

1. Filial Vsesoyuznogo nauchno-issledovatel'skogo kinofoto-instituta Kazan'. Submitted January 7, 1964.

EMT(1)/EWG(k)/EPA(sp)-2/EPA(u)-2/EEC(t)/EEC(b)-2/EMA(m)-2Pab-24 TJP(c)/AFVIL/SSD/ADM(p)-2/ESD(t)/RAFM(t) AT ACCESSION NR: AP4046402 ś/0056/64/047/003/0878/0885

AUTHORS: Khaykin, M. S.; Edel'man, V. S.

TITLE: Measurement of bismuth conduction electron momenta and observation of their reflection by the surface

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47,

TOPIC TAGS: bismuth, single crystal, conduction electron, surface impedance, cyclotron resonance, surface property

ABSTRACT: The momentum of the conduction electrons in single crystals of bismuth approximately 0.2 mm thick was measured by the cyclotron resonance cutoff method and found to be (5.4 \pm 0.15) x 10^{-22} g-cm/sec in the direction of the binary axis. The investigations were made by a frequency modulation method (M. S. Khaykin, PTE, No. 3, 95, 1961) at frequencies between 9.75 and 8.75 Gc. 'The prepara-

L 2082-65 ACCESSION NR: AP4046402

tion of the sample was described by the authors in ZhETF v. 43, 2063, 1962. The crystais were placed in strip resonators (single strips for plane-parallel samples and double strip for samples with wedge-like part) and kept at 1.7--1.5K during the experiment. An additional peak of the surface impedance of bismuth was observed at a field smaller than the cutoff field (~3 Oe), and is attributed to cyclotron resonance of the electrons experiencing specular reflection from the surface of the sample. A characteristic feature of this peak is that it moves in a direction opposite to that of the cyclotron resonances when the frequency of the electromagnetic field is decreased. Such a behavior can be explained if it is assumed that this peak is connected with cyclotron resonance on the electrons experiencing specular reflection from one of the surfaces of the sample. Several experiments are described, the results of which agree with this explanation. "The authors thank P. L. Kapitsa for interest and attention to the work, R. T. Mina and I. A. Fal'kovskiy for a discussion, and G. S. Cherny*shev and V. A. Yudin for

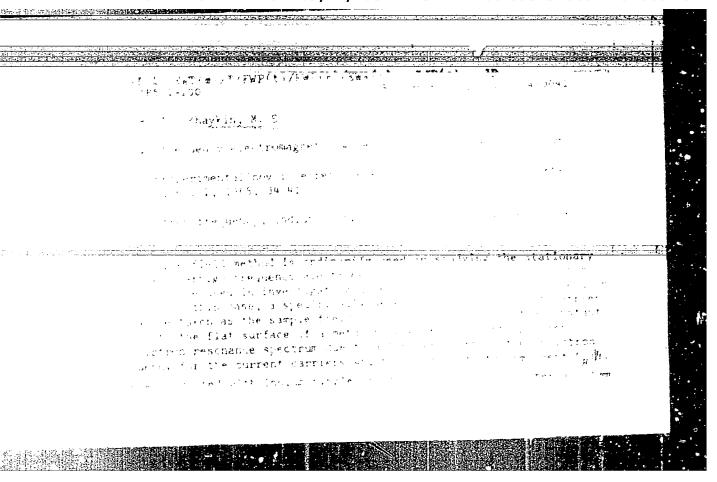
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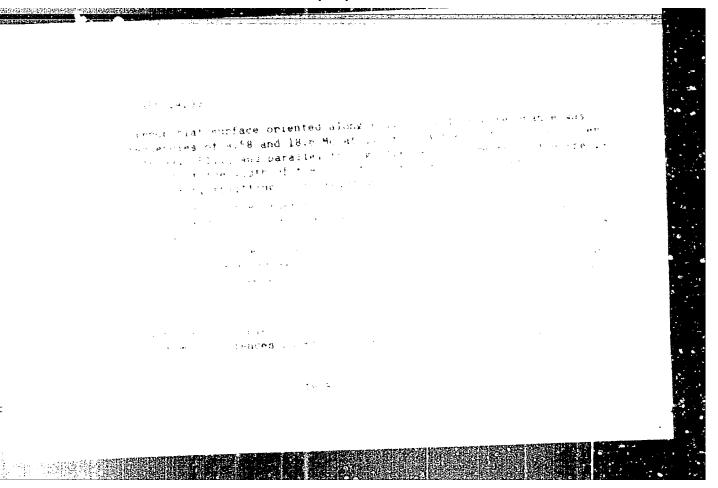
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KHAYKIN, M.S.; IEVKOYEV, I.I.; KUKHTIN, Y.A.

Synthesis of certain 3-methyl and 3-phenyl-4-amino-5-pyrazolinones. Zhur, org. khim. 1 no.1:133-136 Ja *65. (MIRA 18:5)

1. Kazanskiy filial Vsesoyuznogo nauchno-issledovatel skogo kinofoto-instituta.





KHAYKIN, M.S.; FEDORINA, L.G.; FAKHRUTDINOV, A.S.; KUKHTIN, V.A.

Synthesis of some derivatives of 7,8-dihydroxybenzopyrylium chloride and 7,8-dihydroxycoumarin. Zhur.org.khim. 1 no.2:356-358 F 165. (MIRA 18:4)

1. Kazanskiy filial Vsesoyuznogo nauchno-issledovatel'skogo kinofotoinstituta.

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RUL', Ye.F.; KHAYKIN, M.S.; DERSTUGANOV, G.V.

Developing properties of some dephnetin derivatives and tanning action of the products of their exidation. Zhur. nauch. i prikl. fot. i kin. 10 no.2:146-147 Mr-Ap *65.

(MIRA 18:5)

1. Filial Vsesoyuznogo nauchno-insledovatel*skogo kinofotoinstituta, Kazan*.

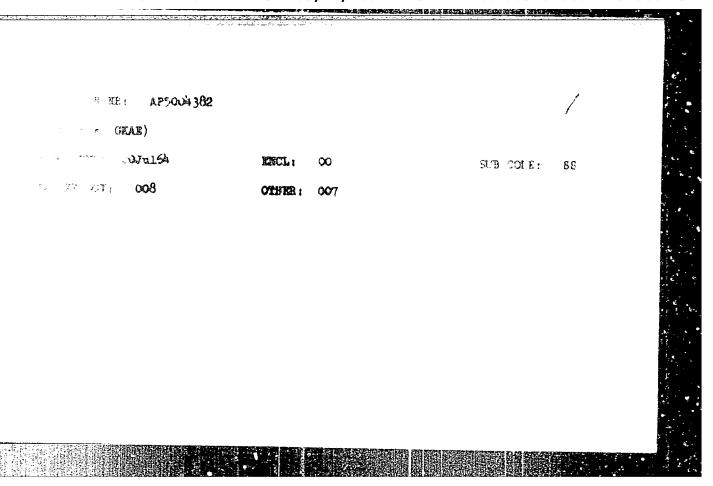
HACKERY ESSENTIAL TO THE PARTY OF THE PARTY aman esa elipania elia esa domente el perimorio menorente de constante de la composición de la composición de · ##: AP3004382 \$ (788-57657.34 57001/0111/0121 Wine, R. T.; Khaykin, M. B. vestigation of the Permi surface or indium 'cornal eksperimental'moy i teoreticheskoy fisiki, v. 45, ac 1, 1965, indium, Permi surface, free electron model, effective mass, tarrier welocity, cyclotron resonance is view of the lack of precision investigations of the Fermi surface of relarly by the cyclotron resonance method, the such we wand this methwe the effective masses of the carriers to 1 dies. And to study their and the (010), (001), and (111) planes. The indice single crystals inente grown in the form of discs 17.8 mm in d nameter, theree semples w thick and the fourth 0.31 mm thick. The single crystal was placed in gity tuned to 18.7 Gcs. The magnetic field will applied parallel to the of the sample and was rotated in this place. The reactive occasionent hard impedance of the metal was measured by the frequency medication

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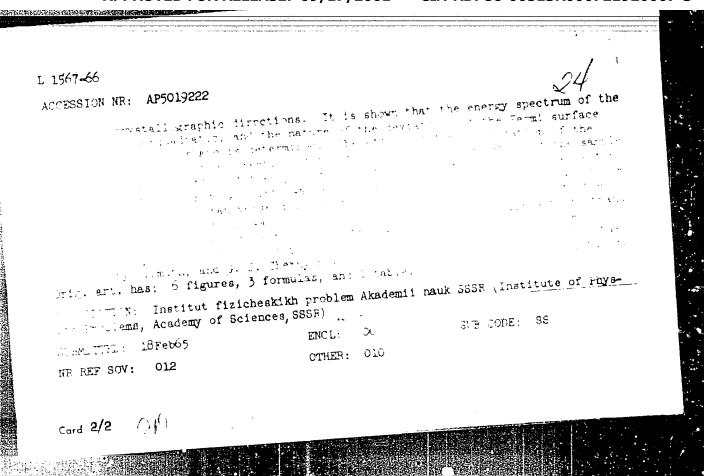
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ribed by one of the authors elsewhere (Ehaykin, PTE, No. 1 75, 1961). The masses were determined from the cyclotron spectra by a formula denie authors in an earlier paper (ZhETF, v. 15, 1304, 1963). The extremal of the Fermi hole surface were determined by the method of cutting off the resonance. The value 0.208 ± 0.002 obtained for the effective mass field directed along the 1.0 axis is in good agreement with other publicused and compared with the model of the Fermi surface of indium, with the Fermi surfaces of metals having a similar trystal structure is concluded that the nearly-free-electron approximation not only surface of the Fermi surface of each individual setal, but also into metals. The authors in the Fermi surface due to increments in the metals. The authors thank for a Aprilia for outlineous interestion, and G. S. Chernyshiv and V. A. Tudio for tempical help.

educate Town Institut fizicheskikh problem Akademii man 1807 Institute of cleaces 888R; Fizieneskiy institute GKAT Physics



AUTHOR. Edel'man, V. S.; Khaykin, M. S. TIPLE: Investigation of the Fermi surface in bismuth by means of cyclotron rescandance yet (**) SOURCE: Zhurnai eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 1, 1965, TOPIC TAGS: bismuth, cyclotron resonance, electron spectrum, excitation energy APSTRACT: The article contains the results of a detailed investigation of cyclo- mance in bismuth, which made it possible internal on the accurately than investigation of the standard of the shape of the standard of the access and the anisotropy of the effective masses were determined in the large 1/2	L 1567-66 ENT(1)/ENT(m)/EPF(c)/T/ENP(t)/1 ACCESSION NR: AP5019222	UR/0056/65/049/001/0107/0116
APSTRACT: The article contains the results of a detailed investigation of cyclo- management of the article contains the results of a detailed investigation of cyclo- management of bismuth, which made it possible to intend on the accurately than the particle stative attributes to the station of the accurate purity. The sample temperatures were 1.51.7K. The exact value of the accurate purity. The anisotropy of the effective masses were determined in the	11112: investigation of the Fermi surface	in bismuth by means of cyclotron rescul
Are tract. The article contains the results of a detailed investigation of cyclomance in bismuth, which made it possible to determine more accurately than the particle of the state and the anisotropy of the effective masses were determined in the	SOURCE: Zhurnal eksperimental noy i teored	ticheskoy fiziki, v. 49, no. 1, 1965,
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Markin, M. S.; Edel'man, V. S.	
Institute of Physics Problems, Academy of Sciences SSSR (Institut fizicheskikh	
Torral eksperimental'noy i teoreticheskoy fiziki, v. 43, nc. b, 1965,	
TIPIT TAGS: magnetic field, plasma wave, cyclotron resonance, plasma resonance, is there shift, bismuth, single crystal, Doppler effect, magneticalities plasma	
ABSTRACT: Measurements were made of the magnetic fields which define the region of strong damning of magnetic plasma waves as a result of cyclotron resonance of carriers in implementation resonance of the experiments the author that the log-like action resonance of the electrons and the authority at the log-like action of the range of the experiments involved observation of two magnetoplasma wave modes protygated in a common like compile) in	
cyclotron resonance shift made it possible to determine the Fermi velocities of the	
electrons along the directions close to the binary axis and the corresponding velocities of holes in the barrl plane, and to obtain a more accurate value of the effective	
mass of the holes at a special point in the Fermi surface of the basal plane. The	
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1smuth 1.00 and 01047 r	at approximately 9.4 Gc, using two singlemm thick. The excitation of the plasma	waves was observed by	and production of the
easuring the flow of posimple. The experiments the Fermi velocity of the contract of the contr	ower through a transmission strip resonat s vere made in a field up to 10 kOe, at a he holes in the basal plane was found to	tor enclosing the temperature 1.5K.	
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KHARITON, Yu.B.; KONDRAT'YEV, V.N.; BOROVIK-F MANOV, A.S.; ZAVARITSKIY, N.V.; MALKOV, M.P.; KHAYKIN, M.S.; SHARVIN, Yu.V.

Aleksandr Iosifovich Shal'nikov; on his 60th birthday. Usp. fiz. nauk 87 no.1:171-172 S *65. (MIRA 18:9)

L hu730-66 ENT(m)/ENP(t)/ETI IJP(c) ACC NR: AP6031983 UR/0386/66/004/005/016 SOURCE CODE: AUTHOR: Khaykin, M. S.

ORG: Institute of Physics Problems, Academy of Sciences SSSR (Institut fizicheskikh problem Akademii nauk SSSR)

TITLE: Oscillatory dependence of the surface impedance of a metal on a weak magnetic field

SOURCE: Zhurnal eksperimental noy i teoreticheskoy fiziki. Pis ma v redaktsiyu. Prilozheniye, v. 4, no. 5, 1966, 164-169

TOPIC TAGS: tin, indium, cadmium, aluminum, tungsten, copper, bismuth, galvanomagnetic effect, surface property, electric impedance, electron scattering

ABSTRACT: The author explains the physical causes of the oscillatory dependence of the surface impedance Z on a weak magnetic field H in the microwave region, recently observed in Sn, In, Cd, Al, Cu, and W, and reports some results of its investigation in Bi, chosen because its Fermi surface has been investigated in detail. The explanation is based on an allowance for the contributions made to the microwave current by electrons moving along arcs whose centers lie above the surface of the metal. These electrons penetrate to a certain depth and return after some time to the surface, from which they are scattered (or ref. t.d). Two possible electron orbits are considered, and it is shown that the proposed explanation applies to both. An estimate of the period of the oscillations yields for ordinary metals (Sn) at $\omega = 6 \times 10^{10} \text{ sec}^{-1}$ a

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L Ш730-66 ACC NR: AP6031983 value ~3 Oe, which agrees with published experimental data. The value obtained for Bi is =0.3 Oe, which also agrees with experiment. Whereas the impedance oscillations in ordinary metals have the character of rather smooth curves, the oscillations in Bi have an essentially different form, with narrower peaks accompanied by suboscillations on the side of the larger fields. The sharpening of the oscillations may be attributed to the contribution of the electrons that have experienced an m-fold specular reflection from the surface, but the appearance of the suboscillations is not fully explained. It is concluded that the proposed explanation of the origin of the oscillations in & weak field apparently solves the problem in principle, but the development of an exact theory is still necessary. The author thanks P. L. Kapitsa for interest in the work and R. T. Mina and V. S. Edel man for a discussion. Orig. art. has: 2 figures and 2 formulas. OTH REF: 005 SUBM DATE: 06Jun66/ ORIG REF: 006/ SUB CODE: 20/ W 2/2 Card

EWT(1)/EWT(m)/EEG(k)-2/T/EWP(t)/EI/EWP(k) JJP(c) WG/RTW/JD L 45104-66 SOURCE CODE: UR/0056/66/051/001/0062/0086 ACC NR. AP6024865 66 13 AUTHOR: Mina, R. T.; Khaykin, M. S. ORG: Institute of Physical Problems of the Academy of Sciences, SSSR (Institut fizicheskikh problem Akademii nauk SSSR); Physics Institute CKAE (Fizicheskiy institut GKAE) TITLE: Investigation of the fermi surface and current carrier velocities in indium by the cyclotron resonance method SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 51, no. 1, 1966, 62-86 TOPIC TAGS: fermi level, cyclotron resonance, effective mass, indium, current chrrier, ELECTRON HOLE ABSTRACT: The results of the systematic investigation of cyclotron resonance in indium single crystals are presented. The measurements were carried out at a frequency of 18.7 Gc/s and a sample temperature of 1.5K. Anisotropy of the hole and electron effective masses was studied in the (010), (110), (111), (011), and (001) crystallographic planes. The velocities of the current carriers on the Fermi surface were determined by analyzing the results obtained. The hole velocity on the "rib" of the surface lying in the (001) Brillouin plane was found to be equal to 0.73×10^8 cm/sec. The anisotropy of the effective masses (a change from 0.11 to 2.2 $m_{\rm e}$, and of the current-carrier velocities (from 0.73 x 10^9 to 1.10 x 108 cm/sec), was in good agreement with the almost free electron model, <u>Cord 1/2</u>

providing the mass m of the current carriers is taken to be equal to 1.6 m. The dimensions of the hole Fermi surface along the [100] and [001] directions (0.91 and 079 h/a, respectively) were determined by making use of the resonance cyclotron cut-off effect in a thin sample. A number of experimental facts which are not consistent with the almost free electron-value model were established. In order to explain them, calculations of some features of the Fermi surface model were performed. These yielded the effective potentials the indium lattice |V₁₁₁| = 0.07 ± 0.015; |V₀₀₂| = 0.055 ± 0.01; |V₂₀₀| <0.015 in (h/a) /2mc = 0.329 Ry units. Orig. art. has: 18 formulas, 14 figures, and 4 tables. [CS]

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04407-67 EWT(d)/EWT(1)/EWT(m)/T/EWP(t)/ETI = TJP(c)US/JD/WW ACC NR: AP6034420 SOURCE CODE: UR/0386/66/004/008/0290/0295 AUTHOR: Khaykin, M. S.; Krasnopolin, I. Ya. ORG: Institute of Physics Problems, Academy of Sciences SSSR (Institut fizicheskikh problem Akademii nauk SSSR) TITLE: Nonlinearity of resistance of a metallic point contact and detection of microwaves at helium temperatures SOURCE: Zhurnal exsperimental noy 1 teoreticheskoy fiziki. Pis ma v redaktsiyu. Prilozheniye, v. 4, no. 8, 1966, 290-295 TOPIC TAGS: resistivity, nonlinear effect, low temperature research, electron flow, superconductivity, volt ampere characteristic, microwave detection ABSTRACT: In view of recent investigations of the nonlinearity of the electric resistance of point contacts cooled with liquid helium, with one of the electrodes made either of a semimetal or a superconductor, the authors report some results of a study of the properties of contacts of ordinary pure metals which are in the normal state at low temperatures. The objects of the investigation were contacts made of thin Pt wire (10 µ dia) and a bulky Sn sample (other materials were also tested). The contact produced at liquid-helium temperature by welding with a weak electric discharge. Two methods were used to study the behavior of the resistance R of the contact: plotting the static voltage-current characteristics (V(I), and measurement of the low-frequency voltage A obtained by detecting in the contact modulated microwave radiation (40 GHz; Card 1/2

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10 - 100 μW, obtained from the open end of a waveguide introduced into the Dewar vessel and beamed on the investigated contact, which was placed in liquid helium). The static volt-ampere characteristics V(I) of the welded contacts disclosed the presence of a region of nonlinearity of R, which in some cases narrows down and degenerates in practice into a jump of R. Similar effects were observed also in contact produced without welding from Pt, Sn, Al, Cu, Au, Nb, and Bi, merely by slightly touching the sharp point and the bulky sample. Increasing the area of the contact by pressing against the point led to vanishing of the nonlinearity of the resistance of the contact and of the detection effect. These facts give grounds for assuming that the nonlinearity of the resistance of the point contact is due principally to the contact geometry and not to individual proporties of the metals constituting the contact. The authors relate the nonlinearity of the resistance to changes in the drift velocity acquired by the electrons moving through the contact region. These electrons can radiate effectively hypersonic phonons of wavelength ~10-6 cm, i.e., of the order of the dimensions of the contact. This favors excitation of coherent induced emissions of phonons from inside the contact, and this should cause deceleration of the electrons in the contact, i.e., an increase of resistance. The observed jumps in contact resistance are probably manifestations of the peculiarities of the phonon spectrum of the metallic crystal serving as the contact electrode. The authors thank P. L. Kapitsa for interest in the work, R. T. Mina and V. S. Edel'man for a discussion, and G. S. Chernyshev and V. A Yudin for technical help. Orig. art. has: 3 figures. SUB CODE: 20/ SUEM DATE: 12Jul66/ OTH REF: 006

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SOURCE CODE:

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AUTHOR: Mina, R. T.; Edel'man, V. S.; Khaykin, M. S.

ORG: Institute of Physics Problems, Academy of Sciences, SSSR (Institut fizicheskikh problem Akademii nauk SSSR); Yerevan Physics Institute (Yerevanskiy fizicheskiy institut)

TITLE: Cyclotron resonance of carriers in aluminum

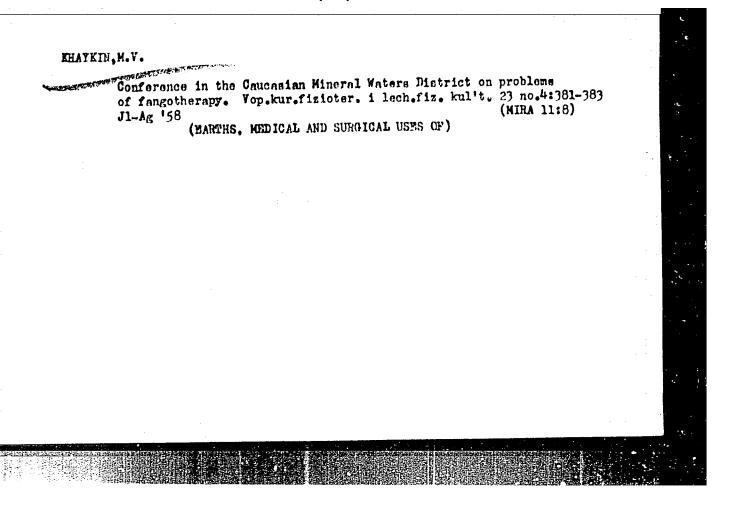
SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 51, no. 5, 1966, 1363-

TOPIC TAGS: aluminum, cyclotron resonance, current carrier, carrier scattering, crystal surface, surface property, magnetoresistance

ABSTRACT: To obtain more accurate data on the anisotropy of the effective masses of the carriers than afforded by the various orthogonalized plane-wave models, the authors investigated the carrier velocity by a cyclotron resonance procedure, determining the cyclotron resonance of the electrons and holes in the (010) plane of aluminum at frequencies 9.45 and 18.7 GHz. The single-crystal aluminum investigated was the same as was studied by Ye. P. Vol'skiy (ZhETF v. 46, 123, 1964). The cyclotron resonance measurements were made by the method of frequency modulation in a magnetic field up to 10 kOe at a sample temperature 1.5K. Cooling of the sample from 4.2 to 1.5K more than doubled the cyclotron resonance amplitude. The values of the effective masses were determined from plots of the logarithmic derivative of the re-

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KHAYKIN, M. Z.

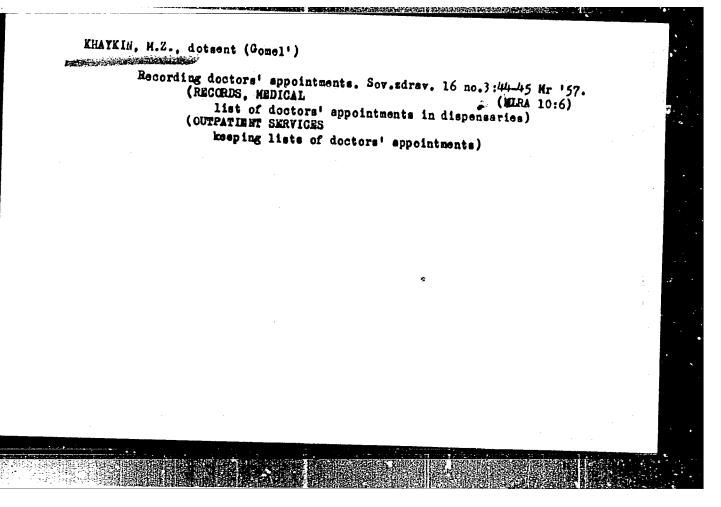
"Organization of Home Medical Aid in Cities of the USSR." Thesis for degree of Cend. Medical Sci. Sub 29 Nov. 50, Acad Med Sci

Summary 71, 4 Sep 52, <u>Dissertations Presented</u>
for <u>Degrees in Science and Engineering in Moscow</u>
in 1950. From <u>Vechernyaya Moskva</u>, Jan-Dec 1950.

KHAYKIN, M.Z.		performed by obstetrics, i postpartum. dents methods sanitation in period of 195 given, attend	The Khabe motion pi jects she Soviet pi ments in tology, r trations	"Motion Pi of Public Chair of t rovsk Med	USSR/Medicine
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- 1. KHAYKIN, M. Z.
- 2. USSR 600
- 4. Nurses and Nursing
- 7. Organization of nursing at the regional medical center, Hed. sestra, No. 12, 1952.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

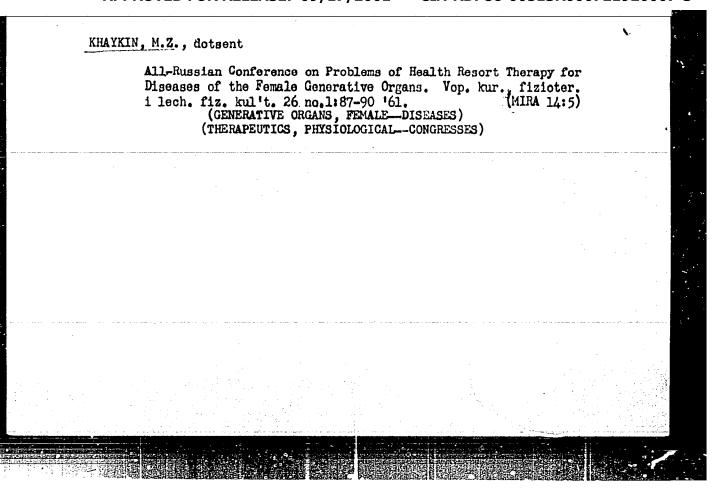


MHAYKIN, M.Z. dots., starshiy nauchnyy sotrudnik.

Conference on practic and science devoted to clinical aspects.
diagnosis and treatment of cholecystitis. Vop.kur., fizioter.
i lech. fiz. kul't. 23 no.5:477-480 S-0 '58 (MIRA 11:11)

1. Bal'neologicheskiy instituta na Kavkasskikh Mineral'nyth Vodakh.

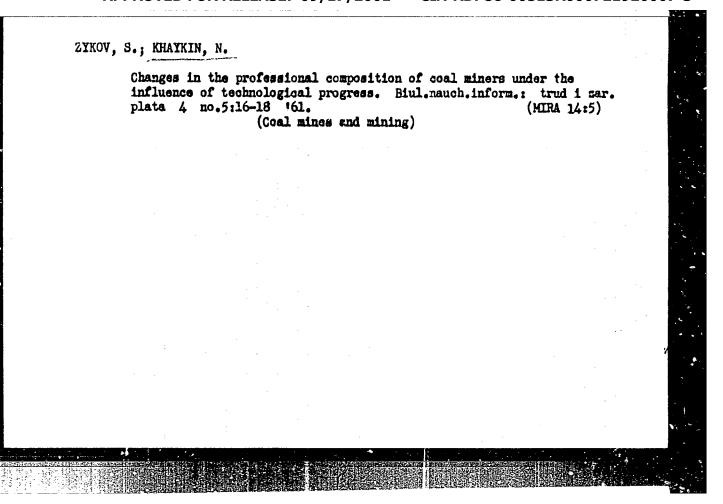
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KHAYKIN, M.Z., dotsent

Out-of-town session of the Academy of Medical Sciences of the U.S.S.R. in the Caudasian mineral waters region. Vop. kur., fizioter. i lech. fit. kulit. 24 no.6:557-563 N-D '59.

1. Pyatigorskiy tal'neologicheskiy institut. (THERAPEUTICS, PHYSIOLOGICAL_CONGRESSES)



KHAYKIN, N.

Important problems of miners' vocational education. Prof.-tekh.

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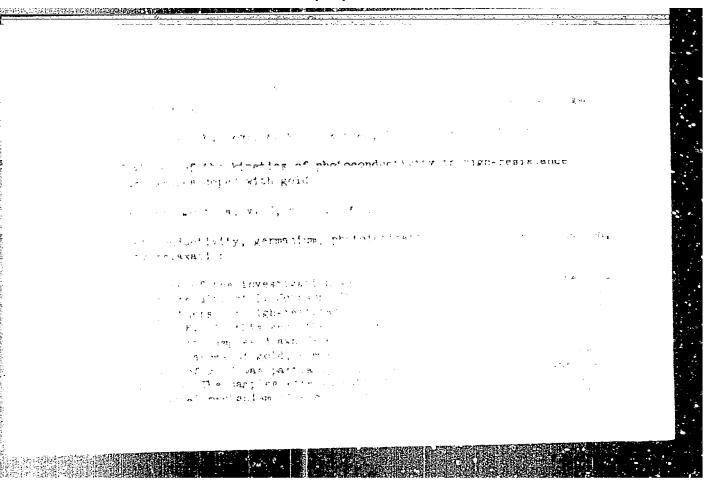
(Mining engineering-Study and teaching)

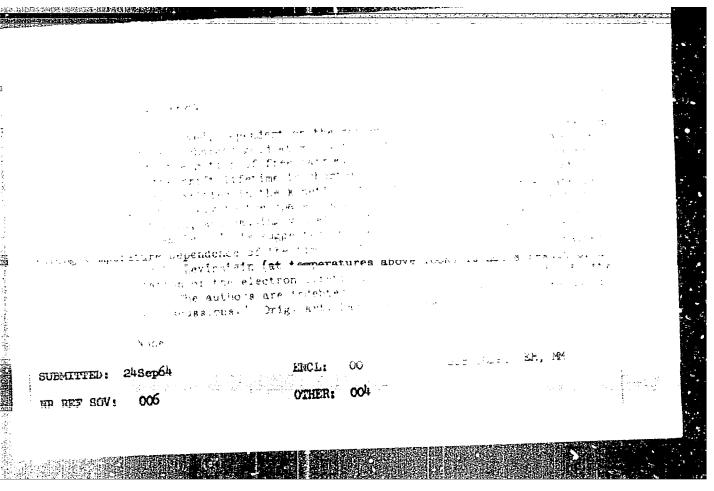
NAZAROV, V.; KHAYKIN, N.

Four-year vocational and technical schools. Prof.-tekh.obr, 20 no.2:3 F '63. (MIRA 16:2)

1. Glavnyy spetsialist po gornoru delu Gosudarstvennogo komiteta po professional no-tekhnicheskomu obrazovaniyu (for Nazarov). 2. Starshiy inzhener nauchno-issledovatel skoy laboratorii Gosudarstvennogo komiteta po professional no-tekhnicheskomu obrazovaniyu (for Khaykin).

(Miners-Education and training)





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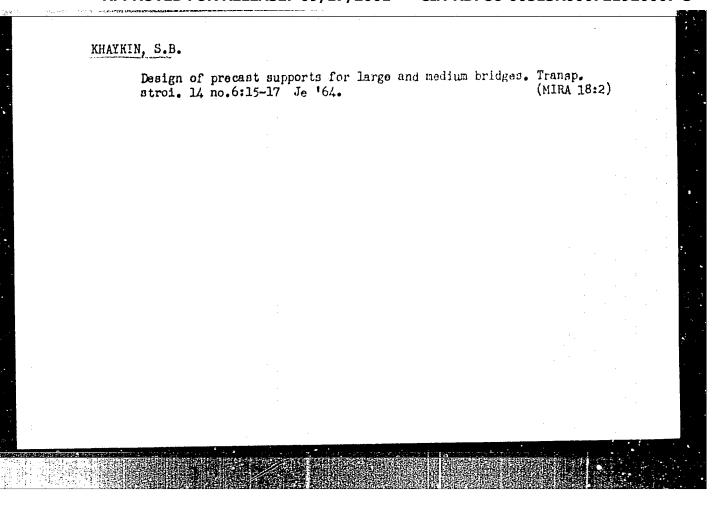
L 40045-66 ENT(1) SOURCE CODE: UR/0120/66/000/003/0172/0174 ACC NR: AP6022022 AUTHOR: Khaykin, N. Sh. ORG: none TITLE: Setup for measuring sensitivity-frequency characteristics of photodetectors SOURCE: Pribory i tekhnika eksperimenta, no. 3, 1966, 172-174 TOPIC TAGS: radiation receiver, photoreceiver, photodiode, REDIATION DETECTOR, ABSTRACT: A method of undesirable-pickup suppression and a setup for measuring sensitivity-frequency characteristics of radiation detectors (photodiodes, photomultipliers) are described. Essentially, the radiation flux modulated by an electrooptical element is once more modulated at $\Omega \geq (2-3)\Delta\omega$, passband width of an analyzer that records the photoresponse of the test detector; the second modulation is accomplished by a mechanical (60-kc) modulator. An experimental setup included a Kerr cell and operated satisfactorily within 1-120 Mc. It was used for testing a few photodiodes (1-35 Mc) and a photomultiplier (1-80 Mc). "In conclusion, the authors wish to thank S. A. Kaufman for his constant attention to the work and discussing the manuscript and also V. A. Voronin, V. P. Sushkov, and M. A. Trishenkov for their part in the development of the outfit." Orig. art. has: 3 figures and 1 formula. SUB CODE: 09 / SUBM DATE: 12Jun65 / ORIG REF: 002/ ATD PRESS: 5 0 5 2 UDC: 535.232.6

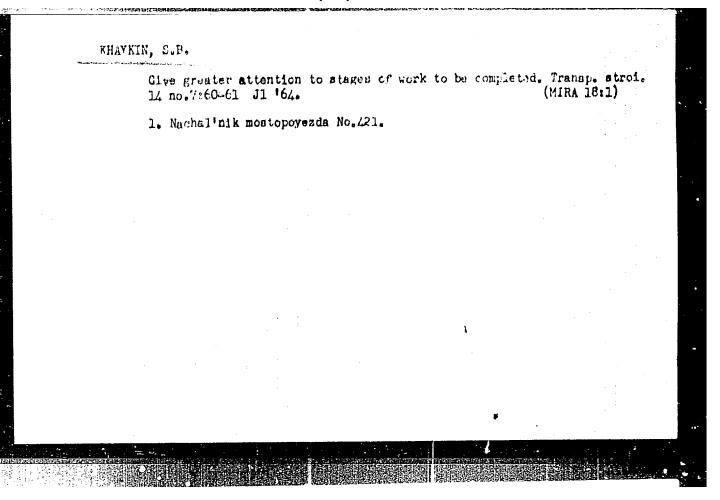
KH/YKIN, S. B.; RAYKHMAN, I. Ye.

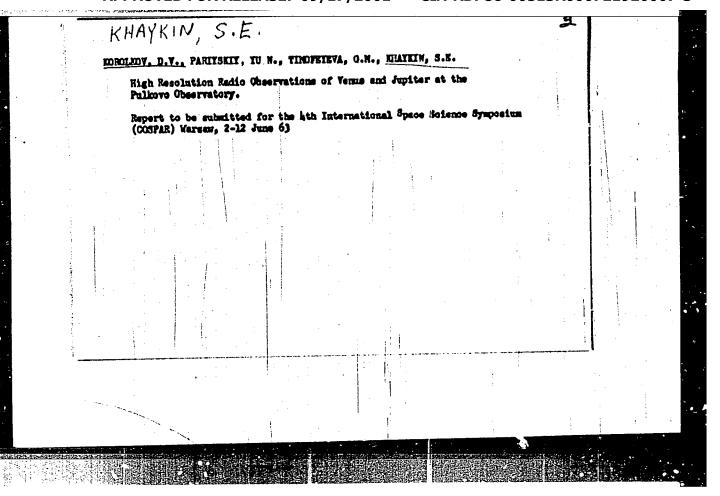
They write to us. Transp. stroi. 13 no.3:62 Mr 163. (MIRA 16:4)

1. Machal'nik mortopoyezda No. 421 tresta po stroitel'stvu mostov Glavmost/stroys Ministerstva transportnogo stroitel'stva SSSE (for Khaylon). 2. Machal'nik tsekha zhelezobetonnykh konstruktejy combinata podsobnykh predpriyatiy Yushuraltransstroya (for Raykhman).

(Construction industry)







KHAYKIN, Semen Emmanuilovich; GPIGOROVA, V.A., red.; MURASHOVA, N.Ya., tekhn. red.

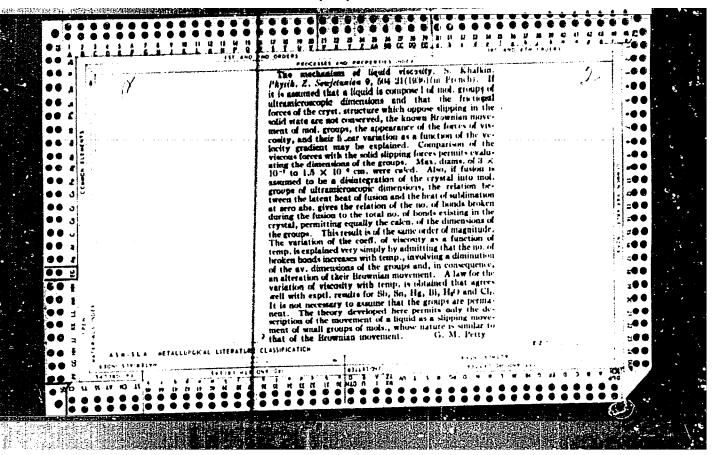
[Physical bases of mechanics] Fizicheskie osnovy mekhaniki.

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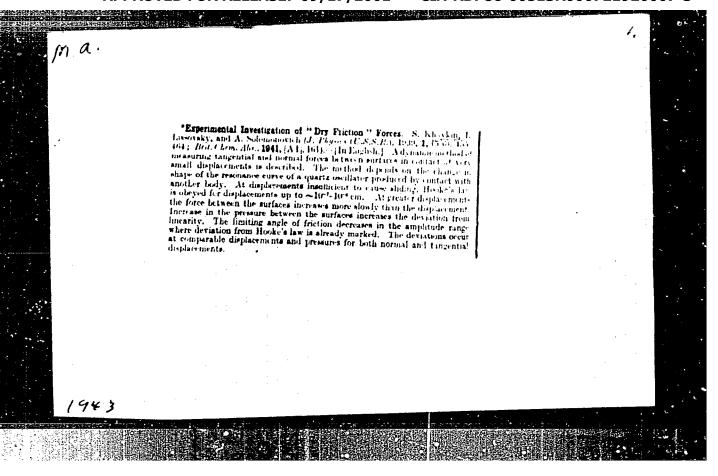
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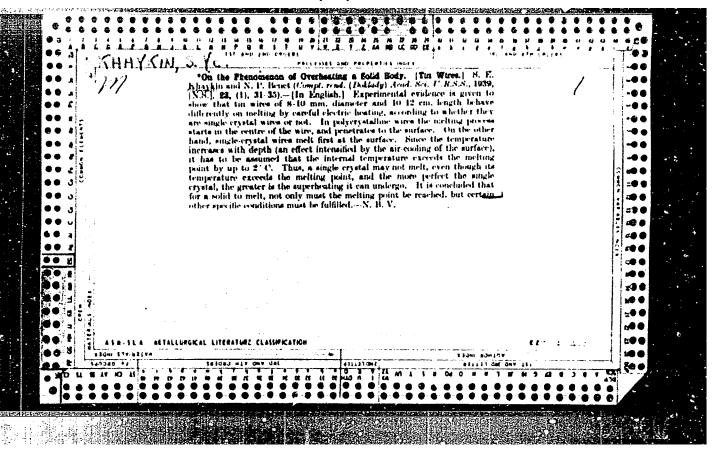
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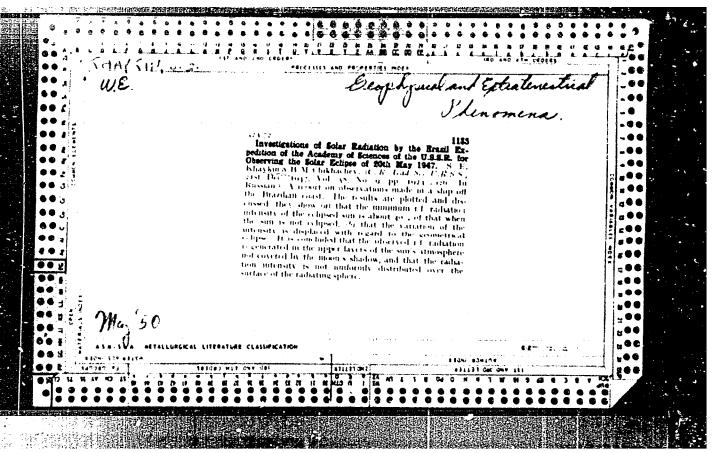
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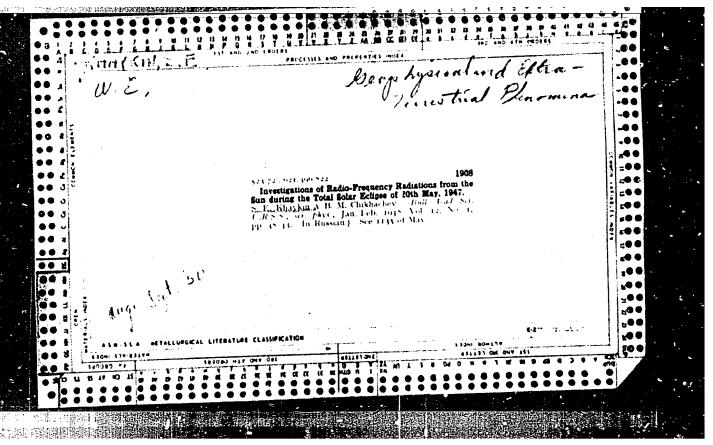
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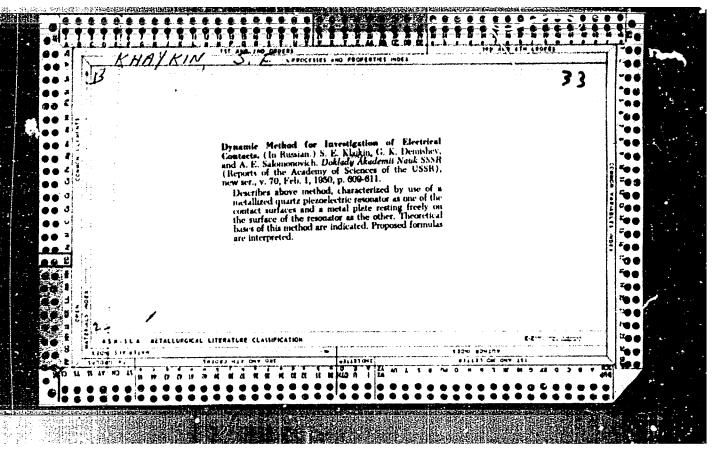
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